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THE RELATIONSHIP BETWEEN INTENTIONAL LEARNING, INCIDENTAL LEARNING AND TYPE OF REWARD IN PRESCHOOL EDUCABLE MENTAL RETARDATES.

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DESCRIPTORS- *EXCEPTIONAL CHILD RESEARCH, *MENTALLY HANDICAPPED, *REINFORCEMENT, LEARNING, EDUCABLE MENTALLY HANDICAPPED, PRESCHOOL CHILDREN, CHILDREN, CLASSROOM RESEARCH, INCIDENTAL LEARNING, GAMES, CHILDREN'S GAMES, POSITIVE REINFORCEMENT,

THE PURPOSE OF THIS RESEARCH WAS TO STUDY THE EFFECTS OF DIFFERENT REWARDS FOR INTENTIONAL LEARNING ON INCIDENTAL LEARNING ACQUIRED BY PRESCHOOL EDUCABLE MENTAL RETARDATES IN A GAME SITUATION. AN ADULT EXPERIMENTER TAUGHT EACH RETARDATE TO PLAY MOTOR, SOCIAL AND PROBLEM-SOVLING GAMES (INTENTIONAL LEARNING.) A SECOND ADULT SERVED AS A PLAYER AND EXHIBITED MANNERISMS (INCIDENTAL LEARNING) WHILE PLAYING. TO EMPHASIZE THE RULES, THIS PLAYER MADE ERRORS AND WAS CORRECTED BY THE EXPERIMENTER. THE PLAYERS EITHER WERE GIVEN TANGIBLE, SYMBOLIC, OR SOCIAL REWARDS, OR WERE NOT REWARDED. THEY RECEIVED ONLY ONE TYPE OF REWARD IN ANY ONE GAME. IT HYPOTHESIZED THAT THE HIGHEST INTENTIONAL AND LOWEST INCIDENTAL SCORES WOULD RESULT FROM TANGIBLE REWARDS. THE BEST INTENTIONAL-INCIDENTAL SCORE COMBINATION WOULD RESULT FROM SOCIAL AND SYMBOLIC REWARDS. THE HIGHEST INCIDENTAL SCORES WOULD OCCUR IN THE NO-REWARD CONDITION. THE FOLLOWING RESULTS WERE OBTAINED. IN EXPERIMENT ONE INTENTIONAL LEARNING DID NOT VARY AS A FUNCTION OF TYPE OF REWARD. SUCCESS IN THE GAME APPEARED TO BE A MORE POWERFUL REINFORCER THAN THE REWARDS OFFERED BY THE EXPERIMENTER (THE RETARDATE TYPICALLY EXPERIENCES SOCIAL PLAY DEPRIVATION AND FAILURE IN GAME SITUATIONS). IN EXPERIMENT TWO ALL RETARDATES WERE ACCUSTOMED TO SUCCESS IN GAME SITUATIONS. THE HIGHEST INTENTIONAL SCORES RESULTED FROM TANGIBLE REWARDS. THE HIGHEST INCIDENTAL SCORES OCCURRED IN THE NO-REWARD CONDITION. THE INCIDENTAL SCORES IN THE TANGIBLE AND SOCIAL REWARD CONDITIONS DID NOT DIFFER. BOTH TANGIBLE AND SOCIAL REWARDS WERE ASSOCIATED WITH A SATISFACTORY INTENTIONAL-INCIDENTAL SCORE COMBINATION. DESCRIPTIONS OF THE GAMES ARE PRESENTED IN THE APPENDIX. A REFERENCE LIST INCLUDES 32 ITEMS. (AUTHOR)

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Dorothea Ross

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Current educational procedures for the preschool, educable, mentally retarded child (to be referred to here as preschool retardate) are based mainly on subjective experience and untested assumptions rather than on research (25). The lack of adequate research in this area poses serious problems for educators who are searching for an empirical basis for the development of educational programs for the preschool retardate. Most authorities (13, 25) agree that the major problem for the preschool retardate is his slow rate of learning, yet there are very few reports in the literature of specific variables that might significantly increase his rate of learning.

The present study was one of a series of investigations designed to identify the factors in training procedures that would facilitate learning in preschool retardates. The purpose of this study was to investigate the relationships between intentional learning, incidental learning, and type of reward in preschool retardates. The question that we were asking was this - Do variations in type of reward for intentional learning result in differences in the amount of incidental learning acquired by the preschool retardate?

Intentional learning is learning which occurs as a result of specific training accompanied by instructions to learn (12). The fact that intentional learning is influenced by variations in type and magnitude of reward has been demonstrated in a variety of experimental situations with preschool children of normal intelligence (12). There are no comparable studies in the literature on preschool retardates, but studies with older retarded children and adults indicate that these subjects respond to positive incentives in a manner similar to normal subjects (19).

Most of the studies on the older retarded subjects have been concerned with the effect of external reinforcers on intentional learning, the following studies being representative of this group. Heber (18) scaled tangible rewards in terms of the personal preference of institutionalized retardates. He than assigned subjects to a high- or low-incentive condition using the subject's own reward preference ranking to determine his particular high- or low-incentive. He found that the high-incentive group performed a simple motor task more efficiently than the low-incentive group, and that when the high-incentive group was shifted to a low-incentive condition there was a rapid substantial decrease in their performance efficiency. Birnbrauer, Bijou, and Wolf (9) reported that symbolic rewards that could be exchanged at intervals for tangible rewards were effective reinforcers with young, educable mental retardates in a special class situation. There was no control group for comparison purposes here. Ellis and Distefano (14) demonstrated that verbal reinforcement, in the form of praise and urging, produced superior performance in

institutionalized retardates in comparison to control subjects performing in the absence of verbal reinforcement. Hunt and Patterson (21) showed that a combination of tangible reward and verbal encouragement resulted in higher learning scores than did tangible reward alone.

A number of studies of incentive manipulation with older retarded subjects have failed to demonstrate that these subjects respond differentially to variations in type of incentive (19). The two main reasons for these failures appear to be that (1) the type of incentive used was inappropriate for the subjects (10, 15, 19), and (2) the attention of the adult experimenter was so reinforcing to the institutionalized subjects (who typically were deprived of nurturant adult contact) that differences were overshadowed which might otherwise have emerged as a function of the incentive variable (13, 30, 31).

Incidental learning can be distinguished from intentional learning by the absence of any specific training. Incidental learning appears to take place in the absence of an induced set or intent to learn the specific behaviors in question (12).

There are no studies on the effects of reward for intentional learning on the acquisition of incidental learning by preschool retardates. The following groups of studies on incidental learning are relevant to this project:

1. Comparisons between older retarded children and children of normal and above-normal intelligence on the incidental learning of environmental nonsocial cues.

The major findings in these studies are that the mentally retarded are capable of incidental learning but are far less effective as incidental learners than are children of normal and above-normal intelligence. In a review of this literature, Denny (13) concludes that the retardate's inability to learn incidentally may be an important factor in his generally poor performance on learning tasks. Denny (13) hypothesizes an "incidental learning deficit" in the retardate and suggests that it should be possible to develop special training techniques and motivational procedures to overcome an appreciable part of this particular learning difficulty.

2. Studies of the incidental learning of social cues through modeling procedures by children of normal intelligence.

The group of studies in the preceding section was concerned with the incidental learning of environmental nonsocial cues. Of particular relevance to this project is the research on the incidental learning of social cues, i.e., incidental

imitative learning. The pertinent findings from this body of research (3, 4, 27) may be summarized as follows:

a. Positive or negative response-consequences to the model are highly influential in determining the extent to which the observer will reproduce the model's behavior.

b. Models who are seen by the observer as competent are likely to command more attention and therefore elicit more imitation than models who lack this quality.

c. Observers who are dependent are likely to be highly attentive to the cues produced by the behavior of others.

3. Studies of the effects of rewards for intentional learning on the acquisition of incidental learning responses by children and adults of normal intelligence.

Bahrick and his associates (1, 2) used college students to test the hypothesis that an increase in incentive results in increased perceptual selectivity favoring those parts of the stimulus field which are interpreted by the subject as most relevant to the expected reward, i.e., intentional learning. According to this hypothesis, a person who is offered an attractive incentive would be expected to exhibit highly selective perceptual responses and would be unlikely to pay attention to irrelevant stimuli, i.e., incidental learning. Under these circumstances, a person offered a less attractive incentive would be more likely to attend to irrelevant stimuli. Bahrick's results showed that a high incentive facilitated the performance of a central task but, in general, interfered with the performance of peripheral tasks.

In a replication of Bahrick's study using grade school children, Kausler, Laughlin, and Trapp (22) reported results apparently contradictory to Bahrick's results. They found that the effect of an attractive incentive was to increase the amount of incidental learning rather than to decrease it. They concluded that for these children the presence of an attractive incentive increases the range of attention to all cues present in the learning situation.

In both studies the subject was instructed to learn a list of geometric forms which were of different colors. The colors were a feature of the learning material which was incidental, but intrinsic, to the task toward which the subject was oriented by the instructions. That the effect of the instructions was minimal in the case of Kausler's grade school children was shown in post-experimental interviews in which many of the subjects stated that they had tried to learn both the forms and the colors. Since the subjects were not oriented by the instructions to learn

the relevant dimensions of the learning task, the total learning situation became one of intentional learning rather than the combination of intentional and incidental learning present for Bahrick's subjects.

The methodology in the present study avoids the procedural errors of Kausler et al (22), by spacing the point of initial presentation of the intentional and incidental learning responses. Our hypotheses are therefore consonant with Bahrick's findings (1, 2) even though his subjects were college students. We expected that the effect of incentive would be to increase the subjects' tendencies to attend to the intentional learning material thus reducing the proportion of the total exposure time available for responding to the incidental learning material.

In the present research, two experiments were conducted to study the effects of variations in type of reward for intentional learning on the amount of incidental learning acquired by preschool retardates in a game situation.

The general procedure in both experiments was as follows: (1) Participation by the retardate in a series of training sessions in which an adult experimenter taught him how to play motor, social, and problem-solving games. Retardates in the three Experimental Groups received a reward (tangible, social, or symbolic) during the training sessions. Retardates in the Control Group were not rewarded but were exposed to neutral comments. (2) Measurement of the retardate's acquisition and retention of intentional and incidental learning.

It was hypothesized that (1) retardates who were given tangible rewards would obtain the highest intentional and the lowest incidental learning scores, (2) retardates who were given social or symbolic rewards would obtain the most favorable combination of intentional and incidental learning scores, and (3) retardates who were not rewarded would obtain the highest incidental learning scores.

EXPERIMENT I - METHOD

Subjects: The subjects (Ss) were 23 boys and 17 girls from special classes for the educable mentally retarded in Palo Alto. All Ss were free of gross motor, sensory, and emotional defects and were not on any medication that could influence their learning ability. The Ss ranged in chronological age (CA) from three years, four months, to nine years, eight months, with a mean of six years, six months, and a SD of 16.42 months. Their IQ's on the Stanford-Binet Intelligence Test, Form L-M, or other equivalent measure ranged from 40 to 92, with a mean IQ of 64.98 and a SD of 11.60. Three of the IQ's were above 80. The Ss' mental ages (MA) ranged from two years, eight months, to six years, five months, with a mean of four years, three months, and a SD of 12.11 months.

Three pre-experimental measures were obtained on each S to provide an objective basis for evaluating the overall equality of the four groups prior to any experimental manipulations. One was a measure of each S's dependent behavior. Differences in dependency might have resulted in marked differences in the amount of incidental learning that occurs independently of the type of reward being offered (3). The other two measures assessed the S's ability to learn from audio-visual presentations under intentional and incidental learning conditions.

Measure of dependent behavior: Behavior unit observations were made of each S in both classroom and free-play situations. Each S was observed for 12 10-minute periods by trained observers who rated the S on scales describing five categories of dependency: instrumental dependency, seeking reassurance, seeking physical proximity, negative-attention-getting behavior, and positive-attention-getting behavior. These five categories have been used frequently in studies of dependent behavior (6, 17, 26, 27, 29). A S's score on each category was the total number of times the behavior defined by the category occurred in the two hours of observation. The scores for the five categories were combined to form a single score that will be referred to as the S's Dependent Behavior Score. As a measure of inter-observer agreement, the number of agreements between the two observers was divided by the number of agreements plus the number of disagreements. Inter-observer agreement was 91 percent. The definition of the dependency categories and information about the scoring procedures is contained in Appendix A.

Measures of ability to learn from audio-visual presentations: One week before the measures of ability to learn from audio-visual presentations were obtained, each S had two sessions with colored slides and taped narration in order to familiarize him with the type of audio-visual presentation to be used in obtaining the measures. Two series of slides were used for the

measures: the first was presented under incidental learning conditions, the second under intentional learning conditions. After each series, the S was questioned about the content. The total number of correct responses for the first series is referred to as the Incidental Film Learning Score and the second series is referred to as the Intentional Film Learning Score.

The Ss were assigned randomly to four groups of 10 Ss each. The four groups will be referred to as Groups One, Two, Three, and Four. A table showing the descriptive statistics by group on CA, IQ, MA, Dependent Behavior Score, Incidental and Intentional Film Learning Scores is contained in Table 1.

Procedure: The game situations used were a two-choice discrimination box game (the Sticker Game), a target game (the Gun Game), and a traffic skills game (the Car Game). Detailed descriptions of the three games are contained in Appendix B.

In each game the experimenter (E) taught the players the rules (intentional learning) and served as the game controller, i.e., she designated the order of play, maintained order, and managed the equipment, an adult model (AM) served as one player and exhibited a variety of verbal and non-verbal mannerisms (incidental learning) as she played, and a S served as a second player.

There were five rules and eight mannerisms in each game. As the E taught the rules that were needed to play the game, she emphasized each one by verbal repetition, by repeated demonstrations, by requiring the S to practice some of the behaviors, by verbally rewarding him when it was appropriate to do so, by correcting him if he made errors, and by brief explanations about the reasons for some of the rules. To emphasize the rules further, the AM systematically broke rules, and thereby allowed the E to draw the S's attention to the rules while play was going on. In contrast to the methods that the E used to emphasize the five rules (intentional learning), the AM exhibited each of the eight mannerisms (incidental learning) casually and without any particular emphasis or comment. In all three games the AM followed a set routine in exhibiting the incidental responses. Neither the AM nor the E paid any attention if the S reproduced the incidental learning responses exhibited by the AM.

For each game there were three Training Sessions on three consecutive days, followed by two Testing Sessions. The first Testing Session was on the day immediately following the third Training Session and the seond Testing Session was one week later.

In the three Training Sessions, the E actively taught the rules. If either player broke a rule, the E corrected him. The AM and the S took turns, with the AM having the first turn. Each player had five turns, all unscored.

TABLE 1

DESCRIPTIVE STATISTICS FOR THE FOUR GROUPS

Measure	Group 1 (n=10)	Group 2 (n=10)	Group 3 (n=10)	Group 4 (n=10)
C.A. (mos.)				
RANGE	60-98	60-105	40-116	63-96
MEAN	79.90	77.80	80.60	74.90
S.D.	13.42	14.89	22.97	11.36
I.Q.				
RANGE	40-84	48-79	45-79	47-92
MEAN	64.90	63.80	63.90	67.30
S.D.	12.63	9.55	11.57	12.14
M.A.				
RANGE	34.80-71.38	33.60-62.41	31.60-76.56	39.01-67.16
MEAN	51.40	49.07	51.26	49.77
S.D.	11.61	8.87	17.16	8.67
INT. FILM				
RANGE	2-21	2-19	3-16	2-18
MEAN	7.40	9.50	8.00	8.60
S.D.	6.10	4.99	3.92	4.32
INC. FILM				
RANGE	2-15	2-9	3-10	1-11
MEAN	6.80	5.20	6.00	5.90
S.D.	4.49	2.14	2.28	3.02
DEP. BEH.*				
RANGE	5-23	9-25	6-20	8-26
MEAN	12.80	14.60	13.60	14.70
S.D.	5.13	5.12	4.67	5.41

*Mean number of dependency behaviors exhibited per 10-minute scoring period.

In the two Testing Sessions, the E served only as a game controller. In the first Testing Session, the AM and the S took turns, with the AM going first, until each player had had five turns. In this session, the AM did not break rules, but she did continue to exhibit the incidental learning responses on every trial. The S then had five additional turns alone, with the AM acting as an interested spectator. The second Testing Session, one week later, was a retention test. The S was invited to play the game again, while the E served as game controller and the AM acted again as an interested spectator. The scores for the ten trials in the first Testing Session will be referred to as the Sticker (or Gun, or Car) Learning Scores and the scores for the two trials in the second Testing Session will be referred to as the Sticker (or Gun, or Car) Retention Scores.

The decision to reduce the number of trials in the second Testing Session to two was made as a result of observations made during the pretesting period. First, the Ss were highly consistent over a series of retention trials, exhibiting almost identical responses from one trial to the next, and second, the Ss were markedly unenthusiastic about starting the games alone and playing them alone. No S had objected to the procedure in the first Testing Session, in which the S played the first five trials with the AM and then played the last five trials alone. However, these latter trials were presented to the S as "there is just enough time for you to have a few more turns by yourself." The unexpected opportunity to have more turns, and the impetus from playing the first five trials, appeared to carry the S through the first Testing Session with no apparent diminishing of enthusiasm.

It would have been preferable to have ten retention trials in the second Testing Session. However, it was more essential that the Ss participate in the retention trials of the second Testing Session with the same enthusiasm that they had shown during the first Testing Session.

To avoid confusion and possible interference, the S learned only one game at a time. After he had completed the training and testing sessions for one game, there was a time lapse of two weeks before he started learning the next game.

During the Training and Testing Sessions for any one game, the S was exposed to only one of the following four reward conditions:

1. Tangible Reward (TR) - Each S was shown an array of sex-appropriate prizes and was told that he was to have a chance to work for a prize. The S was allowed a few minutes to examine the prizes, the prizes were very attractive, the Ss really liked them. Next, the E showed him one container with 25 tokens and a second empty container. The E told him that each time he played the game

he could move one token into the empty container and when he had moved them all into it, he could choose any one of the prizes for himself. In order to emphasize to the S that tokens represented a prize, the array of prizes was always placed immediately behind the two containers. The S moved a token over to the second container at the completion of each trial, regardless of actual performance. The E made general comments at intervals throughout the period of play, but refrained from comments that could be interpreted as praise.

2. Symbolic Reward (SR) - The names of the S and the AM were written on a score sheet and, at the completion of each turn, each player was allowed to put a check beside his name, regardless of actual performance. The E made sure that the S put a check for each turn, but made no comments that could be interpreted as praise.

3. Praise (P) - The E made many supportive comments, both directly to the S and also to the AM, concerning the S's performance. The following statements were used: "You really know how to play this game." "I like the way you play." To the AM: "What a good player S is!" In addition, E smiled and nodded at appropriate times during the S's performance.

4. Neutral Comment (NC) - The E watched the S's performance and commented as frequently as she had in the TR and SR conditions, but she made no comments that could be interpreted as praise.

Over a period of three months, each S learned the three games, each under a different reward condition. Schematically, the reward conditions for the four groups were as follows:

	Group One	Group Two	Group Three	Group Four
STICKER	Tangible	Symbolic	Praise	Neutral
CAR	Symbolic	Neutral	Tangible	Praise
GUN	Neutral	Praise	Symbolic	Tangible

Observers: Two experienced observers, naive as to the purpose of the experiment, recorded the intentional and incidental responses of the Ss in the two Testing Sessions. Percentage agreement was used as a measure of inter-observer agreement. An agreement was counted whenever the two observers recorded a given behavioral act in the same category on the score sheet. Zero entries by both observers were not counted as agreements. An omission by one

observer when the other observer made a tally was considered a single disagreement. Inter-observer agreement was 92 percent.

Because of space problems, the observers were in the experimental room. However, the Ss in the two schools were all accustomed to having adults around and showed little or no interest in the observers.

RESULTS

The mean intentional learning and intentional retention scores obtained by the four groups on each of the three games are presented in Table 2. The prediction that intentional learning would vary as a function of type of reward was not confirmed. Analysis of variance of these data fell far short of the .05 level of significance.

Table 2 contains the mean incidental learning and incidental retention scores of the four groups. Results of the analysis of variance using the Replicated Youden Square model (11) showed that only in the retention trials was incidental learning influenced significantly ($F = 3.45$, $p < .05$) by reward condition. Using simultaneous t-tests (23) the incidental retention scores of the Ss in the Neutral Comment Conditions were significantly greater ($p < .05$) than those of the Ss in the other three conditions. The order of magnitude of the incidental learning scores supported the predictions that the lowest incidental learning scores would be associated with the Tangible Reward Condition, and the highest incidental learning scores, with the Neutral Comment Condition.

The Dependent Behavior Scores that were obtained on each S prior to his participation in the experimental procedures provided the basis for a series of comparisons of the 12 Ss with the highest Dependent Behavior Scores (Hi Dep) and the 12 Ss with the lowest Dependent Behavior Scores (Lo Dep). (These two sub-groups of Ss did not differ on CA, MA, IQ, or Intentional Film Learning Score. The Hi Dep Ss were significantly higher on Incidental Film Learning Scores.) The results of the series of comparisons are contained in Table 3. In all but one case, the Hi Dep Ss had significantly higher incidental learning and incidental retention scores than did the Lo Dep Ss.

A statistical check was made to determine whether there were differences among the four groups on any of the six pre-experimental measures: CA, IQ, MA, Dependent Behavior Score, Intentional Film Learning Score, and Incidental Film Learning Score. One-way analyses of variance showed that there were no differences among the four groups on any of these measures.

The scores of ability to learn from audio-visual materials that were obtained from each S prior to his participation in the experimental procedures did not correlate with the intentional and incidental learning scores.

TABLE 2

MEAN INTENTIONAL LEARNING, INTENTIONAL RETENTION, INCIDENTAL LEARNING AND INCIDENTAL RETENTION SCORES PER TRIAL* FOR THE FOUR GROUPS

Game		Group One (n=10)		Group Two (n=10)		Group Three (n=10)		Group Four (n=10)	
		LG	RET	LG	RET	LG	RET	LG	RET
Sticker	M	4.25	3.90	4.33	4.30	4.23	4.20	4.44	4.10
	SD	0.61	0.97	0.43	0.46	0.57	0.75	0.66	0.44
Intent'l.		Tangible		Symbolic		Praise		Neutral Com	
Gun	M	4.54	4.30	4.10	3.90	4.00	4.00	4.39	4.10
	SD	0.39	0.60	0.84	0.86	0.74	0.59	0.42	0.58
Intent'l.		Symbolic		Neutral Com		Tangible		Praise	
Car	M	4.38	3.55	3.66	3.35	3.79	3.80	4.11	4.05
	SD	0.71	1.27	1.06	1.14	0.96	0.95	0.69	0.79
Intent'l.		Neutral Com		Praise		Symbolic		Tangible	
Sticker	M	1.98	2.05	2.48	2.40	2.78	2.35	3.74	3.50
	SD	1.68	2.01	1.28	0.94	2.48	1.98	1.91	1.83
Incident'l.		Tangible		Symbolic		Praise		Neutral Com	
Gun	M	0.82	0.91	1.01	1.45	0.33	0.40	1.08	1.05
	SD	0.77	0.65	1.02	1.01	0.32	0.44	0.91	0.69
Incident'l.		Symbolic		Neutral Com		Tangible		Praise	
Car	M	2.07	2.15	1.67	1.20	1.92	1.35	1.64	1.13
	SD	1.69	1.78	1.03	0.60	2.21	0.95	1.34	0.78
Incident'l.		Neutral Com		Praise		Symbolic		Tangible	

*Mean scores per trial were used in order to make the results of the first Testing Session (ten trials) comparable to the results of the second Testing Session (two trials).

TABLE 3

COMPARISON OF INCIDENTAL LEARNING AND
INCIDENTAL RETENTION SCORES OF
HI DEP AND LO DEP SS

Score	Hi Dep (n=12)	Lo Dep (n=12)	t	p*
Inc. Sticker Lg.	3.51	1.98	1.73	.05
Inc. Sticker Ret.	3.29	1.88	2.19	.025
Inc. Gun Lg.	1.29	0.51	2.28	.025
Inc. Gun Ret.	1.08	0.88	--	n.s.
Inc. Car Lg.	2.70	1.11	3.31	.005
Inc. Car Ret.	2.17	1.00	2.39	.025

*One-tail tests

DISCUSSION

The major finding in this study was that intentional learning did not vary as a function of type of reward. Examination of the results in connection with the Ss' reactions to the games and to the experimental procedures that were used suggested the following explanation for the failure to obtain differences in the intentional learning scores.

There was evidence that the experience of success in the game was a novel and highly reinforcing one for the Ss and that one result of this variable was to diminish the effects of the reinforcers offered by E. Evidence for this contention is provided by our own observations coupled with teachers' and parents' reports. Eighty-six percent of the Ss who received tangible rewards (n = 26) reported their success in playing the game before they mentioned their prize. Ninety percent of all the Ss (n = 36) engaged in spontaneous self-praise in all three game situations, thus adding a heavy overlay of praise to all conditions.

To understand the reinforcing effect of success in the game it is necessary to consider, within the framework of social learning theory (28), the atypical social history of the preschool retardate.

Preschool retardates characteristically experience a specific kind of social deprivation, social play deprivation. Opportunities for learning to play do not occur as frequently for the preschool retardate as they do for the preschool child of normal intelligence and, when they do occur, the retardate is seldom able to obtain maximum benefit from them due to the complexity of the usual play situation. As a result, he does not acquire good social play skills. When the retardate does have the opportunity to participate in social play, he experiences many more failures than successes. Consequently, he develops an expectancy of failure in social play situations and becomes increasingly reluctant to participate (19, 28).

However, if the retardate were to succeed in a social play situation, this success experience would be highly reinforcing and previous failure experiences would serve to heighten his response to the success. In such a situation, the satisfaction that the retardate experiences from succeeding would likely be a more powerful reinforcer than extrinsic rewards available to him in the situation. Although the extrinsic rewards may differ markedly, the effects of these differences might be obscured by the powerful effects of the success experience.

The behavior of the Ss in this study was consistent with this explanation. Eighty-five percent of the Ss were very reluctant

to participate in the first game situation. The following verbatim comments suggest that their reluctance stemmed from fear of failure: "I'm no good in games," "I don't know how to play that," "This game is awful hard, I can't play it," and "I like just watching." However, following the initial success in the game, the Ss' expectancy of success increased rapidly and the effect of previous failures diminished. The Ss became confident and very enthusiastic. The following comments are representative of the Ss' reaction to their new status in the game situation: "Hey, I can play this game better than you!", "You keep breaking rules and I never do," "I am the best at this game," "I never played this good in a game."

Their feeling of success was heightened by the procedure of having the AM make mistakes. Almost without exception the Ss tried to help the AM. In the process of helping the AM, the Ss focused on her behavior, verbalized her errors, engaged in overt rehearsal to show her "the right way to do it," and frequently reminded her of rules prior to each turn. As a result, most Ss became extremely proficient in the rules of the game.

The E's reactions to the AM's errors also served to facilitate the Ss' acquisition of the intentional learning. The S saw the AM experience mild reproof (punishment) for his errors and verbal confirmation (reward) for performing the correct response. Recent research on the effects of modeling procedures has shown that if a S sees a model punished for a response, this experience reduces the probability that the S will exhibit the punished response in the same situation (3). Furthermore, if the model is then made to exhibit an appropriate response in the situation, and is rewarded for exhibiting this new response, the possibility that the S will also exhibit the correct response is increased. The effectiveness of the modeling procedure used in this study is consistent with this research.

It will be recalled that, in studies of older retarded Ss, the two factors that were associated with the failure to obtain differences in intentional learning as a function of incentive were (1) the inappropriateness of the incentive (10, 15, 18) and (2) the high reinforcement value of adult attention for the S (13, 30, 32). Neither of these factors appeared to be operating in the present study.

The finding that the incidental retention scores varied as a function of type of reward is consistent with the explanation offered for the failure to obtain differences in intentional learning. The AM displayed the incidental learning responses casually and without any particular emphasis or comment and neither the E nor the AM paid any attention if the S reproduced the incidental learning responses. The incidental learning scores were therefore more free to vary as a function of incentive. The differences

that did occur were probably minimized by two factors. First, the overlay of self-praise in all conditions might have minimized the magnitude of the differences, and second, the magnitude of the incidental learning scores may have been decreased as a result of the AM making mistakes. Other research (3) has shown that models who are viewed by observers as incompetent elicit less imitation than do models who are seen as competent. The comments of many of the Ss in this experiment suggested that they viewed the AM's game performance as incompetent.

The finding that Ss with high Dependent Behavior Scores acquired more of the incidental material than did Ss with low Dependent Behavior Scores is consistent with theoretical formulations and empirical studies of dependent behavior (3, 4, 27) in young children of normal intelligence.

The above explanation concerning the overriding effects of the success in the game variable is based on non-empirical observational data.

To provide an empirical test of this explanation, a second experiment was conducted in which the Ss who participated were accustomed to success in games and to adults making errors in game situations. There were only slight procedural differences between the games used in the two experiments.

EXPERIMENT II - METHOD

Subjects: The Ss were 18 boys and 18 girls from special classes for the educable mentally retarded in the Palo Alto area. All Ss were free of gross motor, sensory, and emotional defects and were not on any medication that could influence their learning ability. All Ss were accustomed to functioning successfully in games and to seeing adults make errors in these situations.

The Ss ranged in CA from four years, 11 months, to nine years, 11 months, with a mean of seven years, eleven months, and a SD of 17.06 months. Their IQ's on the Stanford-Binet Intelligence Test, Form L-M, or other equivalent measure, ranged from 53 to 79 with a mean IQ of 68.77 and a SD of 7.09. Their MA's ranged from three years, five months, to six years, 11 months, with a mean of five years, five months, and a SD of 10.11 months. The Dependent Behavior Score described in Experiment I was obtained on the 36 Ss in Experiment II. Many of the Ss (n = 21) participated in both experiments.

The Ss were assigned randomly to three groups of 12 Ss each. These groups will be referred to as Groups One, Two, and Three. Table 3A on the following page contains the descriptive statistics for the three groups.

Procedure: The game situation used was a two-choice discrimination box game (Fishing Game). A detailed description of the Fishing Game is contained in Appendix B.

The game procedures used in Experiment II differed in the following respects from those used in Experiment I:

1. To avoid ceiling effects, there were 10 rules (intentional learning) and 17 mannerisms (incidental learning) in the Fishing Game. Each of the games used in Experiment I had five rules and eight mannerisms.

2. There were 10 trials in the Second Testing Session of Experiment II. In Experiment I, there were two trials in this Session.

3. The Symbolic Reward Condition was omitted in Experiment II because these Ss expected symbolic rewards to lead to tangible rewards. This expectation was a result of their participation in a game training program unrelated to the present experiment.

Observers: The procedure for the observers did not differ from that in Experiment I. Inter-observer agreement on the game scores was 94 percent.

TABLE 3A

DESCRIPTIVE STATISTICS FOR THE THREE GROUPS
IN EXPERIMENT TWO

Measure	Group 1 (n=12)	Group 2 (n=12)	Group 3 (n=12)
C.A. (mos.)			
RANGE	66-119	59-119	86-119
MEAN	93.17	93.08	101.25
S.D.	19.88	19.44	12.75
I.Q.			
RANGE	59-79	53-78	57-77
MEAN	70.08	69.33	66.92
S.D.	6.59	7.85	7.42
M.A.			
RANGE	43.6-82.1	41.3-83.3	55.9-80.2
MEAN	64.73	64.04	67.13
S.D.	12.49	13.17	6.18
DEP. BEH.*			
RANGE	3-19	6-21	6-20
MEAN	10.01	12.50	12.25
S.D.	4.91	5.02	4.26

*Mean number of dependent behaviors exhibited per 10-minute scoring period.

RESULTS

The prediction was confirmed that intentional learning would vary as a function of type of reward with the highest scores being associated with the Tangible Reward Condition. Analyses of variance of these data were significant for both the intentional learning ($F = 12.22$, $p < .0005$) and the intentional retention scores ($F = 4.27$, $p < .02$). Tangible rewards were associated with higher intentional learning scores than were praise ($t = 2.41$, $p < .01$)* or neutral comments ($t = 4.74$, $p < .0005$)* and also with higher intentional retention scores than praise ($t = 1.89$, $p < .04$)* or neutral comments ($t = 2.85$, $p < .005$)* Ss who were praised learned more of the intentional material than did Ss who experienced neutral comments ($t = 2.34$, $p < .03$)** but they did not retain more. Table 4 contains the means and standard deviations of the intentional learning and retention scores of the three groups.

The hypothesis that Ss in the Tangible Reward Condition would obtain the lowest incidental scores was not confirmed. The incidental scores of Ss who were given tangible rewards did not differ from those of Ss who were praised although the trend was in the predicted direction.

The hypothesis was confirmed that Ss who were not rewarded (neutral comments) would obtain the highest incidental scores. Analyses of variance performed on these scores showed that both incidental learning ($F = 5.78$, $p < .007$) and incidental retention ($F = 4.44$, $p < .02$) were influenced significantly by reward condition. Ss in the Neutral Comment Condition obtained higher incidental learning scores than did Ss in the Praise ($t = 2.11$, $p < .02$)* and the Tangible Reward Conditions ($t = 3.25$, $p < .002$)*. Ss in the Neutral Comment also obtained higher incidental retention scores than did Ss in Praise ($t = 2.25$, $p < .025$)* or Ss in Tangible Reward ($t = 2.45$, $p < .02$)*. Table 4 contains the means and standard deviations of the incidental learning and retention scores of the three groups.

The hypothesis that praise would be associated with the most favorable combination of intentional and incidental scores was not confirmed. The scores in both the Tangible Reward and the Praise Conditions were satisfactory in this respect. The rationale for this statement will be explained in the Discussion Section.

A statistical check showed that there were no differences among the three groups on the pre-experimental measures of CA, IQ, MA, and Dependent Behavior Score.

*One-tail test
**Two-tail test

TABLE 4

MEAN INTENTIONAL LEARNING, INTENTIONAL RETENTION, INCIDENTAL LEARNING AND INCIDENTAL RETENTION SCORES PER TRIAL* FOR THE THREE GROUPS**

Type of Learning	Group One (n=12)		Group Two (n=12)		Group Three (n=12)	
	LG	RET	LG	RET	LG	RET
Mean	8.28	7.72	7.16	6.47	5.86	5.95
SD	0.94	1.43	1.20	1.65	1.39	1.48
INTENTIONAL Reward	Tangible		Praise		Neutral Com	
Mean	2.79	2.73	3.58	2.91	5.14	4.63
SD	1.71	1.58	1.79	1.51	1.68	2.01
INCIDENTAL Reward	Tangible		Praise		Neutral Com	

*Mean scores per trial were used in order to make the results more comparable to the results of Experiment I. Note that there were 10 rules (Int. Lg.) and 17 mannerisms (Inc. Lg.) in Experiment II compared to five rules and eight mannerisms in Experiment I.

**Summary of results:

INT. LG. Tang. Rew. > Praise ($t = 2.41$, $p < .01$)
Tang. Rew. > Neut. Com. ($t = 4.74$, $p < .0005$)

INT. RET. Tang. Rew. > Praise ($t = 1.89$, $p < .04$)
Tang. Rew. > Neut. Com. ($t = 2.85$, $p < .005$)

INC. LG. Neut. Com. > Praise ($t = 2.11$, $p < .02$)
Neut. Com. > Tang. Rew. ($t = 3.25$, $p < .002$)

INC. RET. Neut. Com. > Praise ($t = 3.25$, $p < .025$)
Neut. Com. > Tang. Rew. ($t = 2.45$, $p < .02$)

DISCUSSION

The finding that the acquisition of intentional learning responses is significantly influenced by variations in type of reward is consistent with research on older retardates (19). The expectation that tangible rewards would have higher incentive value than praise for these preschool retardates was supported by the order of magnitude of the intentional learning scores but not by that of the incidental learning scores.

The results of this study provide further empirical support for the inverse relation between motivational level and incidental learning that Bahrick and his associates (1, 2) have demonstrated with college students. Ss who were rewarded, either tangibly or with praise, learned less of the incidental material than did Ss who were exposed to neutral comments.

This inverse relation is attributed to a restriction of perceptual range with increasing motivation and has no relationship to the amount of learning that the S is able to acquire (1, 2). Two different score comparisons provide support for this statement. First, in both the learning trials and the retention trials, the intentional-incidental learning ratio was greater for the Tangible Reward Condition (3:1) and for Praise (2:1) than it was for Neutral Comment (1:1). This finding suggests that the Ss in the Tangible Reward and Praise Conditions were more selective while those in the Neutral Comment Condition tended to pay equal attention to all of the AM's behaviors. Second, the total learning scores (intentional plus incidental learning) of the three groups did not differ, thus providing support for the idea that the inverse relationships that did occur were the result of increased selectivity on the part of the Ss who were given tangible rewards or who were praised.

The finding that the intentional-incidental learning ratio was greater for the Tangible Reward and Praise Conditions than for the Neutral Comment Condition provides empirical support for a suggestion by Benoit (7) concerning training for the young retarded child. According to Benoit, consistent responding is necessary for differential learning to occur and the retarded child does not respond consistently in an ordinary learning situation. He responds to the stimulus of the moment rather than to internal maintaining stimuli or sets, i.e., he is a stimulus-bound organism. Benoit states, however, that with appropriate instructions or with rewards, consistent responding should occur and the retarded child should then exhibit differential learning. In Benoit's framework, our Neutral Comment Ss were more stimulus-bound while our Tangible Reward and Praise Ss exhibited differential learning.

It was hypothesized that the most favorable combination of intentional and incidental learning would be acquired by Ss in

the Praise Condition. To determine what constitutes the most favorable combination requires a consideration of the requirements of middle childhood games.

To function successfully in game settings in middle childhood, a player should possess reasonable competence in general game skills and a knowledge of the specific skills and rules needed for a particular game. He should also be capable of using the jargon associated with a particular game when it is appropriate to do so. By "jargon" we mean the specialized vocabulary and verbal and motor mannerisms commonly used by players in a particular game but not essential in the actual playing of the game (24).

According to these criteria, the most favorable combination of intentional and incidental learning in the Fishing Game would be a high score on the intentional learning (skills and rules) combined with familiarity with the incidental learning (jargon). Since the performances of the Ss in both the Tangible Reward and the Praise Conditions were satisfactory in these respects, both of these conditions produced a favorable combination of intentional and incidental learning. The Ss in the Neutral Comment Condition obtained low scores on the intentional learning.

The expectation that the reinforcing effects of success in the game would be minimal with Ss who were accustomed to successful game experiences was supported by observational data and by teachers' reports. Only three instances of self-praise were recorded in Experiment II. All Ss showed excitement about winning prizes and 83 percent of the Ss (n = 10) in the Tangible Reward Condition reported winning a prize to their teacher immediately upon entering their classroom.

The Ss' tendency to help the AM play the game correctly was markedly reduced. Only four instances of a S helping the AM were recorded. Presumably the Ss' game experiences in the unrelated game project made them more tolerant of adults' errors in games.

These data support our explanation for the failure to obtain differences in the intentional learning scores in Experiment I, since there were only slight procedural differences in the games used in Experiments I and II.

There has been increasing attention given in the recent literature to the reinforcing effects of stimulus novelty (12). Our data show clearly that the novelty of success in the game was a powerful reinforcer. Similarly, studies of institutionalized retardates (13, 30, 31, 32) have shown that the novelty of adult attention was an effective reinforcer to retardates who typically were deprived of adult nurturance. In devising

experimental procedures for retarded children it would seem essential that any unusual characteristics of the Ss be identified and examined in the light of the planned procedures in order that sources of extraneous reinforcement may be eliminated.

CONCLUSIONS

The following conclusions are drawn from this study:

1. Intentional learning in preschool educable retardates is influenced by type of reward. Retardates who were tangibly rewarded obtained higher scores on the intentional material than did retardates who were praised or who were exposed to neutral comments. Of the latter two groups, retardates who were praised obtained higher scores.

2. One effect of reward vs. non-reward for intentional learning is a difference in the amount of incidental learning acquired by the preschool retardate. Retardates who were not rewarded obtained higher scores on the incidental material than did retardates who were tangibly rewarded or praised.

3. Both tangible rewards and praise are associated with the acquisition of a favorable combination of intentional and incidental learning in a game situation.

The following recommendations are related to the experimental procedures:

1. Some thought should be given to ways in which game procedures can be incorporated into the regular preschool curriculum for retarded children. The finding that success in the game was a powerful reinforcer was unexpected in terms of research on the effects of incentive manipulation, but it was not difficult to accept in view of the home and classroom experiences of the preschool retardate. The preschool retardate rarely has a success experience in games with his normal peers and his retarded peers usually do not know how to play games independently of teacher supervision. The results of this study show clearly that game situations are enjoyable to the retardate and well within his capabilities. The retardate should be able to acquire a number of important social skills, as well as general and specific game skills, through the medium of games.

2. Modeling procedures should be used as a teaching technique for preschool retardates. The technique of having the AM make mistakes in order to emphasize the rules (intentional learning) to the S proved to be an effective teaching method. It caused the Ss to focus on the AM's behavior, to verbalize her errors, to show the AM "the right way to do it," and to remind her of the rules prior to her turn. Preschool classrooms for the retarded typically have at least two adults working with the children; it should be possible to use this procedure as a teaching technique.

The following implications are drawn from the data:

1. The finding in Experiment 1 of a positive relationship between level of dependency as measured by the behavioral unit observations and the incidental learning of social cues supports the results of many studies of young children of normal intelligence (3, 4, 27). Since strong dependency relationships facilitate incidental imitative learning, it is important that the retardate form a strong dependency relationship with his teachers. The existing conditions in the special classrooms that we see regularly do not result in strong dependency relationships. The development of a strong dependency relationship with an adult is contingent upon two factors, generous amounts of love and nurturance plus a reasonable amount of frustration in the form of low adult availability (29). While the first factor appears to be present in these special classrooms, the second factor is not. The teacher and other adults respond <u>immediately</u> to demands from the child. As a consequence, the dependency relationships that do exist are at a lower developmental level than the potential of the situation would indicate.

There is both theoretical and empirical support for the fact that strong dependent bonds can be built between adults and children in a relatively short time (3, 4). It is recommended that the teachers of retardates work on forming such a relationship with their pupils early in the school year.

2. The finding that the experimental performance of the Ss in this study was distorted by a specific experiential factor has important implications for research with these children. In Experiment I, the Ss had clearly experienced a considerable amount of <u>social play deprivation</u> and, as a result, the effects of <u>success in the game</u> were more reinforcing than the incentives offered by E. Similarly, in studies of institutionalized retardates who typically were deprived of adult nurturance (social deprivation) the effects of nurturant adult attention were more reinforcing than the incentives offered by the investigator. In both cases, differences in learning were obscured. In Experiment II, the differences in learning did emerge as a function of the incentive variable.

In devising experimental procedures for retarded children it would seem essential that any unusual characteristics of the Ss be identified and examined in the light of the planned procedures in order that factors that may distort the results can be controlled or eliminated.

SUMMARY

In the present research, two experiments were conducted to study the effects of variations in type of reward for intentional learning on the amount of incidental learning acquired by preschool retardates in a game situation.

The general procedure in both experiments was as follows: (1) Participation by the retardate in a series of training sessions in which an adult experimenter taught him how to play motor, social, and problem-solving games. Retardates in the Experimental Groups received a reward (tangible, social, or symbolic) during the training sessions. Retardates in the Control Group were not rewarded, but were exposed to neutral comments. (2) Measurement of the retardate's acquisition and retention of intentional and incidental learning.

It was hypothesized that (1) retardates who were given tangible rewards would obtain the highest intentional and the lowest incidental learning scores, (2) retardates who were given social or symbolic rewards would obtain the most favorable combination of intentional and incidental learning scores, and (3) retardates who were not rewarded would obtain the highest incidental learning scores.

The major finding in Experiment I was that intentional learning did not vary as a function of type of reward. The incidental retention scores differed in the direction predicted.

The failure to obtain differences in the intentional learning scores was attributed to the fact that success in the game was highly reinforcing for the retarded child and as a result the reinforcement value of the incentives manipulated by E were reduced. In addition, the modeling procedures used were effective and served to reduce further inter-group differences in intentional learning scores.

The effect of success in the game was virtually eliminated in Experiment II because the Ss were accustomed to success in game situations.

In Experiment II, the hypothesis was confirmed that retardates who were given tangible rewards would obtain the highest intentional learning scores, but the hypothesis that these retardates would also obtain the lowest incidental learning scores was not confirmed. The incidental learning scores of retardates who were tangibly rewarded did not differ from those of retardates who were praised although the trend was in the predicted direction.

The hypothesis that praise would be associated with the most favorable combination of intentional and incidental learning

scores was not confirmed. The scores in both the Tangible Reward and Praise Conditions were satisfactory in this respect.

The hypothesis was confirmed that retardates who were not rewarded (neutral comments) would obtain the highest incidental learning scores.

It was recommended that games and modeling procedures be incorporated into the regular preschool curriculum for retarded children.

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APPENDIX A

Definition of Dependency Categories

and

Scoring Procedures

DEPENDENCY CATEGORIES

Instrumental Dependency: The extent to which the child asks adults or children for help with his clothes and dressing, with projects he is working on, with finding his belongings, with getting supplies, and with outdoor physical activities such as climbing, jumping, swinging, etc.

Physical Proximity: The extent to which the child wants to sit on teacher's knee, to touch or lean against her, or to be near her. Also includes physical affection and seeking and following the teacher and other children from one activity to another.

Reassurance: The extent to which the child seeks comfort, consolation and sympathy, protection, and verbal affection from adults or children.

Negative Attention-getting: The extent to which the child criticizes or commands other children or adults. Includes shouting, silliness, clowning, giggling, baby talk that seems to be directed towards attracting attention. Also, aggression (physical or verbal) that is attention-getting, and withdrawal (sulking, crying, pouting, etc.).

Positive Attention-getting: The extent to which the child asks adults or children for praise, recognition of accomplishments, approval, information. Also includes giving information voluntarily, bringing teacher presents, and inviting teacher to participate in activity (not asking for help from her). Smiling at teacher and verbal affection-giving.

DEPENDENT BEHAVIOR SCORE

The Dependent Behavior Score was based on behavior unit observations (B.U.O.) of the Ss' dependent behavior in both classroom and free-play situations. The procedure for making these observations was the same as that used by Sears, Whiting, Nowlis, and Sears (29). Two trained observers watched each S for a total of 12 ten-minute periods and independently recorded any instances of dependent behavior. Each scoring period lasted five minutes and at the end of that time the two observers stopped to compare their results. In the case of disagreement the following procedures were used:

Omissions: When one observer had recorded an instance of dependent behavior and the second observer had not seen it, the behavior was scored as having occurred.

Disagreements: If one observer recorded a behavior in one category and the second observer assigned it to a different category, the two observers discussed the difference and decided how to categorize the behavior.

The categories in which the main sources of omission and disagreement occurred were (1) physical proximity - The younger Ss sometimes wandered about on the playground in an indecisive way, then sat down near an adult but did not interact with the adult. After a while the S would wander away again. In this case it was difficult to decide whether the S was "being near" in a psychological sense or whether the physical proximity was purely accidental, (2) negative-attention-getting - It was sometimes difficult to distinguish between aggression designed to secure attention and pure aggression, and (3) positive-attention-getting - Some Ss smiled almost continually. It was sometimes difficult to distinguish between habitual smiling and smiling at another person.

APPENDIX B

Descriptions of Games

STICKER GAME

Participants:

An experimenter (E), an adult model (AM), and a subject (S).

Equipment:

A pair of plastic jars and a pair of plastic Yogi Bear dolls; a variety of colored stickers with pictures of common animals, flowers, and objects; a sheet on the wall for stickers; a starting line taped to the floor; a small chair for each of the three participants.

Procedure:

The E instructed the AM and the S that they were going to play a game, the object of which was to guess which of the two jars covered a sticker. A trial consisted of the following steps: E hid a sticker under a jar, S walked up, looked under one jar, and when he found a sticker, pasted it on the sheet before returning to his seat.

In the three 5-trial blocks in the Training Sessions, the AM always had the first turn. In the 10 trials in the Testing Session, the AM had the first turn in the five trials in which he participated, the S playing the last five by himself.

Rules:

1. Player must hide eyes while E hides the sticker.
2. Player must remain seated when it is not his turn.
3. Player must start behind the starting line.
4. Player must look under only one jar.
5. Player must paste his sticker on the sheet, he may not bring it back to his chair.

On each trial in the Training Sessions, the AM broke one of the above rules according to a prearranged schedule. On each trial in both the Training and Testing Sessions, the AM exhibited the following incidental learning responses which were totally or partially irrelevant to the discrimination box problem.

Incidental Learning:

1. Marches towards the boxes.
2. "March, march, march."
3. Knocks Yogi Bear off the jar in an aggressive fashion.
4. "Socko."

5. Uses fist to attach wet sticker to sheet.
6. "Bang, bang, bang,"
7. Names sticker upon finding it.
8. Names sticker at the sticker sheet.

Note:

On each trial the E loaded both jars with stickers in order to ensure that the S would complete the entire sequence on every trial. There was no indication that any S suspected that there was a sticker under both jars. The AM always appeared to be trying to guess which jar covered a sticker. The Ss' behaviors also showed clearly that the discrimination problem was a decision-making situation for them.

GUN GAME

Participants:

An experimenter (E), an adult model (AM), and a subject (S).

Equipment:

A Clown Target Game with three holes varying in size. Behind each hole, a colored light (gold, blue, or red) silently controlled from a distance of eight feet. Two guns: a burp gun that made a series of loud, erratic noises and emitted sparks when fired, and a rubber pressure gun loaded with ping-pong balls. Two sets of tickets. A starting-box taped to the floor. A small chair for each of the three participants.

Procedure:

The E instructed the AM and the S that they were going to play a game, the object of which was to scare the clown by hitting him or by making loud noises. The E told the players that "a lot of lights will go on if you scare the Clown." A trial consisted of the following steps: The S gave a ticket to the E and chose a gun. Standing in the starting box, the S fired the gun at the clown. The lights all flashed on each trial, immediately after the S had fired the gun.

In the three 5-trial blocks in the Training Sessions, the AM always had the first turn. In the 10 trials in the Testing Session, the AM had the first turn in the five trials in which he participated, the S playing the last five by himself.

Rules:

1. Player must give the E a ticket to get a gun.
2. Player must ask for the gun he wants by name: Pop or Burp.
3. Player must say, "Please."
4. Player must stand in starting-box to fire the gun.
5. Player must return the gun to E before he returns to his seat.

On each trial in the Training Sessions, the AM broke one of the above rules according to a prearranged schedule. On each trial in both the Training and Testing Sessions, the AM exhibited the following incidental learning responses which were totally or partially irrelevant to the target-shoot procedure.

Incidental Learning:

1. "My turn."
2. Claps hands.
3. "Hi."
4. "Funny face."
5. Makes a funny face.
6. "Pow! Pow!"
7. Points to lights.
8. "See, I got him."

Note:

The Gun Game differed from the Sticker and Car Game in that it was very exciting for the Ss and it moved along more quickly than either of the other two games.

CAR GAME

Participants:

An experimenter (E), an adult model (AM), and a subject (S).

Equipment:

A standard traffic-light box with red, amber, and green lights that were controlled by the E. A large wooden target with a tramp's face on it, a large round opening in the target, representing the tramp's mouth. Ping-pong balls. A small chair for each of the three participants.

Procedure:

The E instructed the AM and the S that they were going to play a game, the object of which was to move up to the traffic-light box. The E told the two players that they could then throw three balls at the tramp. A trial consisted of the following steps: When the amber light came on, the S went to the starting line and watched the traffic lights. On the green light, he moved forward, on the red light, he stopped. When he reached the traffic-light box, he threw balls at the tramp.

In the three 5-trial blocks in the Training Sessions, the AM always had the first turn. In the 10 trials in the Testing Session, the AM had the first turn in the five trials in which he participated, the S playing the last five by himself.

Rules:

1. Player must stand and get ready on the amber light.
2. Player must move forward on the green light.
3. Player must stop on the red light.
4. Player must follow the E's orders re penalties.
5. Player must say, "Here I go." on the first green light.

On each trial in the Training Sessions, the AM broke one of the above rules according to a prearranged schedule. On each trial in both the Training and Testing Sessions, the AM exhibited the following incidental learning responses which were totally or partially irrelevant to the traffic-light procedure.

Incidental Learning:

1. Takes special steps - very long or very short.
2. Whispers to other player re diverting E's attention from game (S must stop on red light but could then move forward if E did not see him).

3. Points up or down.
4. "Look!"
5. "What's that?"
6. Finger to lip to indicate need for silence.
7. "Eat it up."
8. "Right in the mouth, right in the face."

Note:

The Car Game differed from the Sticker and Gun Games in that the procedure (1) allowed the two players to engage in a "conspiracy" against the E, (2) provided the S with a simple strategy that enabled him to "win" quickly, and (3) required that the players accept the E's decisions re penalties.

FISHING GAME

Participants:

An experimenter (E), an adult model (AM), and a subject (S).

Equipment:

A light box with a lion's face attached to the front; the lion's eyes are cut out so that an amber light in the light box can cause them to light up. A buzzer concealed in the light box directly behind the lion's mouth can be used to simulate a growl. The light and buzzer are controlled by E who is positioned eight feet away; the wires are concealed. In front of the lion are a pair of gold piggy banks; one pig has red spots, the other has a blue band tied around his head. To the right of the piggy banks, near E, is an open container full of pennies. To the left of the lion is a portable, fish-shaped chalk board with two clusters of small fish drawn on it, and a chalk brush at its base. A square taped on the floor near the players' chairs is the starting box. A line of tape on the floor at a 45° angle from the normal line of advance from the starting box to E begins immediately past the triangle. A small chair for each of the participants.

Procedure:

The E instructed the AM and the S that they were going to play a game, the object of which was to catch the other player's fish. The E told the two players that they could come up to him one at a time to get a penny and that the player then had to decide which piggy bank the lion wanted the penny to go in. If the player put the penny in the right bank, the lion's eyes would light up. However, if the player put the penny in the wrong bank, the lion would growl. A player could erase one of the other player's fish from the chalkboard whenever he put the penny in the right bank. When he put the penny in the wrong bank the lion growled and the player had to erase one of his own fish.

A trial consisted of the following steps. When the E told the player it was his turn, the player moved to the starting box. When the E told the player to start, the player moved to the triangle, walked over to E, asked for a penny, deposited the penny in one of the two banks, erased the appropriate fish from the chalk board and returned to his seat.

In the three five-trial blocks in the Training Sessions, the AM always had the first turn. In the 10 trials in the Testing Session, the AM had the first turn in the five trials in which he participated, the S playing the last five by himself. The AM did not participate in the Retention Trials (second Testing Session).

Rules:

1. Player must remain seated during other player's turn.
2. Player moves to starting box on "Your turn."
3. Player moves to triangle on "Start now."
4. Player must say, "Penny for the pig."
5. Player must say, "Thank you."
6. Player must deposit money in bank.
7. Player must say, "Pop it in," as he does so.
8. Player must erase the correct fish.
9. Player must say, "Take one away," as he does so.
10. Player must return to his chair immediately after erasing a fish.

On each trial in the Training Sessions, the AM broke one of the above rules according to a prearranged schedule. On each trial in both the Training and Testing Sessions, the AM exhibited the following incidental learning responses which were totally or partially irrelevant to the Fishing Game procedure.

Incidental Learning:

1. Sits with chin on hand.
2. Stands in starting box with hands on hips.
3. Jumps up and down in starting box.
5. Follows circuitous tape route when he leaves triangle.
6. Throws penny in air.
7. Vacillates at banks.
8. Calls spotted pig, "Mr. Measles."
9. Calls other pig, "Old Mumpy Pig."
10. Says, "How about that," when pig choice is right.
11. Says, "Oh, no."

12. Holds head.

13. Shakes finger.

14. Says, "You be quiet," when choice is wrong and buzzer sounds.

15. Says, "Let's go fishing," as he moves to chalkboard.

16. Erases fish by making an X with the brush.

17. Blows on brush after erasing fish.